



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,555	10/24/2003	David C. Lovetro		7490

7590 07/21/2004
DAVID J. SERBIN
LAW OFFICE OF DAVID J. SERBIN
1217 KING STREET
ALEXANDRIA, VA 22314

EXAMINER

CARRILLO, BIBI SHARIDAN

ART UNIT	PAPER NUMBER
----------	--------------

1746

DATE MAILED: 07/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/691,555	Applicant(s) LOVETRO ET AL.	
	Examiner Sharidan Carrillo	Art Unit 1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/24/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 13 and 15 are indefinite because they fail to positively recite a step of cleaning the metal. The claims only recite a step of contacting the metal, which would not necessarily result in cleaning of the metal. Claims 2-3 are indefinite because it recites that the aqueous solution further comprises phosphonic acid, the limitations of which were previously recited in claim 1. Claim 13 is indefinite because it fails to positively recite hydrogen peroxide. Claims 14 and 16 are indefinite because it fails to recited diphosphonic acid. Claim 15 is indefinite because the surfactant is recited twice.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-2, 4,8 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Brasch (4378270).

In reference to claims 1-2 and 12, Brash teaches a method of removing copper from a circuit board by contacting with an aqueous solution comprising hydrogen peroxide and 0.1-20% by weight phosphonic acid (col. 3, lines 25-30, col. 4, lines 17-20, col. 2, lines 35-40). In reference to claims 4-5, refer to col. 3, lines 10-15. In reference to claim 6, refer to the Example, and col. 4, line 34. In reference to claims 7-8, refer to col. 4, line 22.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1 and 8-12 are rejected under 35 U.S.C. 102(e) as being anticipated by Skee (6599370).

Skee teaches stabilized alkaline compositions for cleaning microelectronic substrates, the composition comprising a) a base, b) a stabilizing agent, hydrogen peroxide, c) 0.01-10% chelant (phosphonic acid), and d) surfactant (Abstract, col. 8, lines 53-57, col. 6, line 45). In reference to claim 6, refer to col. 7, line 39, col. 10, line 66. In reference to claims 8-9, refer to col. 45, lines 60-63, col. 8, lines 50-52. In reference to claims 10-11, refer to col. 9, lines 15-19. In reference to claim 12, refer to col. 48, claim 26.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brasch (4378270).

Art Unit: 1746

Brasch fails to teach 35-45% of phosphonic acids. However, it would have been within the level of the skilled artisan to adjust the concentration of phosphonic acid since Brasch teaches that higher concentrations can be used (col. 3, lines 25-30).

11. Claims 9, and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brasch (4378270) in view of Schellinger Jr. (4401509).

Brasch teaches the invention substantially as claimed with the exception of the concentration of sulfuric acid. Schellinger teaches a composition for etching copper from circuit boards using sulfuric acid, hydrogen peroxide, and phosphonic acid. In col. 3, lines 3-5, Schellinger teaches 2-20% sulfuric acid. Schellinger further teaches that the concentration of sulfuric acid is not critical.

It would have been obvious to a person of ordinary skill in the art to have modified the method of Brasch to include adjusting the concentration of sulfuric acid to 2-20%, as taught by Schellinger, for purposes of etching copper from integrated circuit boards.

Brasch, as modified by Schellinger, fail to teach 35-50% of phosphonic acids. However, it would have been within the level of the skilled artisan to adjust the concentration of phosphonic acid since Brasch teaches that higher concentrations can be used (col. 3, lines 25-30). In reference to claim 14, refer to the teachings of Brasch.

12. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Skee (6599370) in view of Morinaga et al. (5885362).

Skee teaches using an alkaline solution. Skee teaches that any suitable base

Art Unit: 1746

may be used but fails to teach an alkali metal hydroxide. Morinaga et al. teach surface treatment (i.e. cleaning etching) using a composition comprising a base, surfactant, peroxide, and a chelant. In col. 12-13 bridging, Morinaga teaches forming an alkaline solution with bases which include ammonia, ammonium hydroxide, and alkali earth metal hydroxides. It would have been obvious to a skilled artisan to have modified the method of Skee to include equivalent bases, such as alkali metal hydroxides, as taught by Morinaga, for purposes of forming an alkaline solution.

13. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Skee (6599370) in view of Morinaga et al. (5885362) and further in view of Watts (4070422).

Skee fails to teach the specific phosphonic acid as recited in claim 16. Watts teaches various phosphonic acids for stabilization of hydrogen peroxide. Col. 3, lines 25-29, teaches hydroxyethylidene 1,1-diphosphonic acid is preferred because of its commercial availability.

It would have been obvious to a person of ordinary skill in the art to have modified the method of Skee to include hydroxyethylidene 1,1-diphosphonic acid, as taught by Watts, for the advantages of commercial availability of the reagent.

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sakamoto et al. teach an electroplating process. Sugihara et al. teach a cleaning fluid for a semiconductor substrate. Zhang et al. teach a composition comprising a surfactant, chelant, hydrogen peroxide, and base. Winkley teaches stabilized hydrogen peroxide solutions. Hayashida et al. teach cleaning the surface.

Art Unit: 1746

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharidan Carrillo whose telephone number is 571-272-1297. The examiner can normally be reached on Monday-Friday, 6:00a.m-2:30pm.

16. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sharidan Carrillo
Primary Examiner
Art Unit 1746

bsc



SHARIDAN CARRILLO
PRIMARY EXAMINER